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Introduction to the CMMI® Acquisition Modu (CMMI-AM)

Module 4:
CMMI-AM and Support

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Agenda

Support Process Areas

- Decision Analysis and Resolution
- Measurement and Analysis
- Transition to Operations and Support

Summary

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Understanding Support Processes

The organizational support environment includes the infrastructure (facilities, tools, equipment, and support to effectively use them) and tools that people need to perform their jobs effectively.

- **Decision Analysis and Resolution DAR**
- **Measurement and Analysis MA**
- **Transition to Operations and Support TOS**

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Agenda

Support Process Areas

- Decision Analysis and Resolution
- Measurement and Analysis
- Transition to Operations and Support

Summary

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Decision Analysis and Resolution

The purpose of decision analysis and resolution is to analyze possible decisions using a formal evaluation process that evaluates identified alternatives against established criteria.

For Acquisition, a repeatable criteria-based decision-making process is especially important, both while making the critical decisions that define and guide the acquisition process itself and later when critical decisions are made with the selected supplier. The establishment of a formal process for decision-making provides the acquisition project with documentation of the decision rationale. Such documentation allows the criteria for critical decisions to be revisited when changes that impact project requirements or other critical project parameters change.

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Poor Decision Analysis and Resolution …

Symptoms

- It is unclear who is authorized to make what decisions
- Decisions are made on primarily subjective bases
- The same issue is “decided” over and over and over
- Rationale for earlier decisions is unavailable when needed to understand the decision later in the project
- Too few choices are considered for major decisions

Why should we care?

- Wasted effort pursuing changing goals
- Lost opportunities
- Low morale
- Perception of indecisiveness (or incompetence) by customer and others

Decision Analysis and Resolution

CMMI-AM Goals and Practices

Specific Goal	Specific Practice
Evaluate Alternatives	• Establish Guidelines for Decision Analysis • Establish Evaluation Criteria • Identify Alternative Solutions • Select Evaluation Methods • Evaluate Alternatives • Select Solutions

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Decision Analysis and Resolution

Goal 1: Evaluate Alternatives 1

Decisions are based on an evaluation of alternatives using established criteria

Establish and maintain guidelines to determine which issues are subject to a formal evaluation process

- Based upon impact of the decision on risk, cost, schedule, performance, personnel, etc.

Establish and maintain the criteria for evaluating alternatives and the relative ranking of these criteria

- *e.g.*, return on investment, schedule impact, performance impact, etc.

Identify alternative solutions to address issues

- Collect a wide range of alternatives by
  - Soliciting input from many stakeholders - Brainstorming
  - Literature search - etc.

Decision Analysis and Resolution

Goal 1: Evaluate Alternatives 2

Select evaluation methods

- Common evaluation methods include analysis, simulation, modeling testing, prototyping

Evaluate alternative solutions using the established criteria and methods

- Document the evaluation process and results

Select solutions from the alternatives based on the evaluation criteria

- Assess risks associated with the selected alternative
- Document results and rationale

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Measurement and Analysis

The purpose of measurement and analysis is to develop and sustain a measurement capability that is used to support management information needs.

For Acquisition, the acquisition project has information needs for determining the status of its activities throughout the lifecycle of the acquisition, the supplier's activities per contractual requirements, and the status of the evolving products acquired. In acquisition projects where multiple products are acquired to deliver a capability to the end-user, or where there are teaming relationships with other acquisition projects to acquire joint capabilities, additional information needs may be identified to ensure programmatic, technical, and operational interoperability product objectives are identified, measured, and achieved.

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Poor Measurement and Analysis

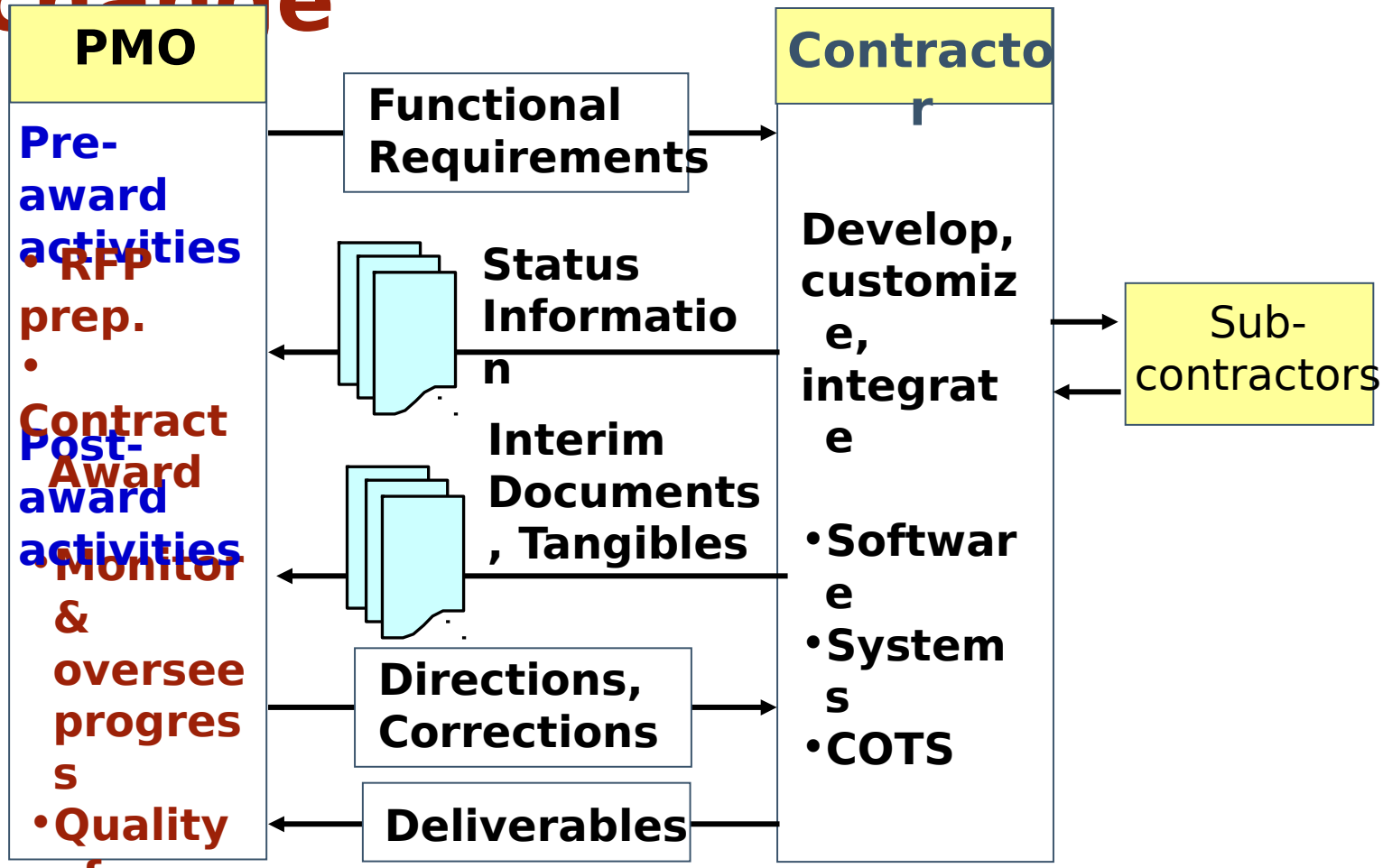
Symptoms

- Management lacks objective data for decision making
- Decisions are based upon intuition
- Status of project is not clearly known
- No historical data is available for reference

Why should we care?

- Bad data or No data ⇒ Bad decisions
- Issues remain undetected until they blossom into problems
- No data ⇒ No learning ⇒ Repeated mistakes

Roles and Information Exchange



PMO Major Responsibilities
Post Contract Award

Contract

Develop the System

Deliverables

Documents
- **SRD**
- **SDP**
- **Meas Plan**
- **SDD**
- **Etc.**

Status Rpts
- **Sched.**
- **Cost**
- **Testing**
- **Etc.**

Final Product

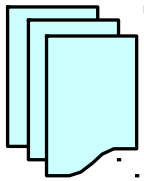
PMO

PMO Responsibilities (Post Contract Award)

- **Evaluate Quality of deliverables**
- **Monitor and Oversight**
  - **Schedule & Progress**
  - **Resources & Costs**
  - **Developer's Asse**

Evaluate Quality of Deliverables

Documents to review
- SRD
- SDP
- Meas Plan
- SDD
- Etc.



Final Deliverables

PMO's Inspection or Review Process

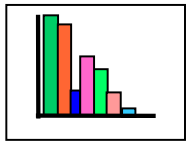
PMO's Evaluation Criteria

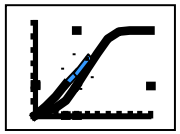
Measurable Results (Examples)

Products
- defects discovered
  - description, severity, class, type
- size of the work product

Process
- effort invested in the inspection process
- time spent during the inspection activities

Indicators





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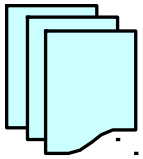
Monitor and Oversee

Status Information



- schedule progress
- budget status
- test results
- process results, *e.g.* inspections
- Process compliance
- etc.

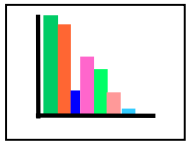
PMO's Analysis & Review Process

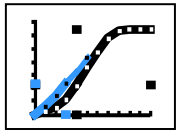
PMO's Evaluation Criteria

Measurable Results (Examples)

- contractor effort actual vs. plan
- contractor schedule actual vs. plan
- defects reported
  - description, severity, class, type
- size, complexity of the work product

Indicators





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PMO vs. Contractor Focus

PMO
Key Management Issues

Contractor's Performance
- Schedule & Progress
- Resources & Cost
- Product Quality

PMO's Performance
- Schedule & Progress
- Resources & Cost
- Product Quality

PMO's Processes
- Documented
- Improvements

Contractor
Key Management Issues

Schedule & Progress

Resources & Cost

Product Size & Stability

Product Quality

Process Performance

Technology Effectiveness

Customer Satisfaction

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Measurement and Analysis

CMMI-AM Goals and Practices

Specific Goal	Specific Practice
Align Measurement and Analysis Activities	• Establish Measurement Objectives • Specify Measures • Specify Data Collection and Storage Procedures • Specify Analysis Procedures
Provide Measurement Results	• Collect Measurement Data • Analyze Measurement Data • Store Data and Results • Communicate Results

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Measurement and Analysis

Goal 1: Align Measurement and Analysis 1

Measurement objectives and activities are aligned with identified information needs and objectives

Establish and maintain measurement objectives that are derived from identified information needs and objectives

- Based on business and project objectives
- Define data latency needs

Specify measures to address the measurement objectives

- *e.g.*, earned value, defect density, milestone satisfaction, process compliance, etc.
- Maintain traceability to objectives

Specify how measurement data will be obtained and stored

- Responsibility for collection
- Storage method / location
- Security
- Format
- Accessibility

Measurement and Analysis

Goal 2: Provide Measurement Results

Measurement results that address identified information needs and objectives are provided

Obtain specified measurement data

- Check data integrity through correlation with other measures

Analyze and interpret measurement data

- Extract information from data to satisfy measurement objective
- Maintain traceability to objectives

Manage and store measurement data, measurement specifications, and analysis results

- Attention to security
- Attention to archiving

Report results of measurement and analysis activities to all relevant stakeholders

- Use consistent format based upon objectives
- Readily and quickly available to relevant stakeholders

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- Transition to Operations and Support

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Transition to Operations and Support 1

The purpose of transition to operations and support is to provide for the transition of the product to the end user and the eventual support organization and to accommodate lifecycle evolution of the product

For acquisition, Transition to Operations and Support involves

- the processes used to plan for and manage the transition of new or evolved products into operational use
- their transition to the eventual maintenance or support organization
- any special conditions that may apply during the eventual decommissioning or disposal of the products

Transition to Operations and Support 2

The acquisition project is responsible for ensuring

- the acquired products meet specified requirements (see Verification)
- can be used in the intended environment (see the Validation)
- can be transitioned into operational use to achieve the users' desired mission capabilities and can be maintained and sustained over their intended life cycles

Transition to Operations and Support 3

The acquisition project is responsible for

- ensuring reasonable planning for transition into operations is conducted
- clear transition criteria exist and are agreed to by relevant stakeholders
- planning is completed for product maintenance and support of products after they become operational

These plans include reasonable accommodation for known and potential evolution of the products and their eventual removal from operational use

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Poor Transition to Operations and Support …

Symptoms

- Operational and support functions are not involved during development
- Support concerns not addressed during development
- Training only addressed late in the development process

Why should we care?

- Product poorly received by Ops and Support
- Deployment delayed due to late Ops training or support training
- Excessive support costs

Transition to Operations and Support

CMMI-AM Goals and Practices

Specific Goal	Specific Practice
Prepare for Transition	• Establish a Transition Strategy • Establish Product Transition Plans • Establish Operations and Support Training Requirements • Establish Lifecycle Resource Requirements • Identify Support Responsibility • Establish Enhancement Criteria • Establish Transition Criteria
Transition Products	• Evaluate Product Readiness • Evaluate Personnel Readiness • Analyze Results and Take Action

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Transition to Operations and Support

Goal 1: Prepare for Transition 1

Preparation for transition to operations and support is conducted

Establish and maintain a strategy for transition to operations and support

- Source of support (organic, contractor, etc.)
- Level of support (line, intermediate, depot, etc.)

Establish and maintain plans for transitioning acquired products into operational use and support

- Documented, available to, and approved by relevant stakeholders

Establish and maintain training requirements for operational and support personnel

- Training objectives
- Skills maintenance
- Trainee skills assessment

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Transition to Operations and Support

Goal 1: Prepare for Transition 2

Establish and maintain initial and life-cycle resource requirements for performing operations and support

- Initial spares
- Facilities
- Future spares and service
- Disposal

Identify and assign organizational responsibility for support

- Identify and involve **EARLY** and **THROUGHOUT** product development

Establish and maintain criteria for assigning responsibility for enhancements

- Magnitude and complexity of enhancement
- Required domain knowledge and experience
- Required acquisition knowledge

Establish and maintain transition criteria for the acquired products

- Assure criteria satisfaction through verification and validation

Transition to Operations and Support

Goal 2: Transition Products

Transition decisions and actions are executed in accordance with transition criteria

Evaluate the readiness of the acquired products to undergo transition to operations and support

- *e.g.* Readiness of product, documentation, training, maintenance equipment, etc.
- Evaluated throughout acquisition life cycle

Evaluate the readiness of the operational and support personnel to assume responsibility for the acquired products

- Skills, training, staffing, support equipment availability, etc.

Analyze the results of all transition activities and identify appropriate action

- Strengths and weaknesses
- Actions to bolster weaknesses

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Summary

PMO plays a critical role in the systems engineering of a project

Principal goals of **Decision Analysis and Resolution**

- Evaluate Alternatives

Principal goals of **Measurement and Analysis**

- Align Measurement and Analysis Activities
- Provide Measurement Results

Principal goals of **Transition to Operations and Support**

- Prepare for Transition
- Transition Products